



Commissioning/Performance Verification – Review of Applications for UESC & Lessons Learned

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The Way it Was

- When asked about M & V
- Response was why, this is not an ESPC?

The Way it Was

- Develop Projects
- Awarded Projects
- Develop More Projects
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A Learning Experience

- Electrical Rates Almost Doubled
- Major Customer Questioned Savings
- Dollar VS Energy Savings
- Lack of Pre or Post Project Data
- Financed Project Moratorium
- Even good metering at building level did not convince this customer

FEMP M & V Resources

- M&V Guidelines: Measurement and Verification for Federal Energy Projects – Version 2.2
- http://www1.eere.energy.gov/femp/pdfs/26265_secv.pdf
- Performance Assurance for Multi-Year Contracts Under the Utility Incentive Program
- <http://www1.eere.energy.gov/femp/pdfs/41898.pdf>

M&V Guidelines

- *The Guidelines* are grouped into four categories or options (A, B, C, & D).
 - Each option is a suggested approach to measurement and verification of energy and water projects
 - Each option provides its own accuracy and risk allocation
 - Each option carries its own associated costs

M & V Options

- Option A – Engineering Calculations
 - A stipulated approach which may include measured values before and after retrofit
- Option B – Metering and Monitoring
 - A measurement approach which may include spot, short term or continuous measurement before and after the retrofit

M & V Options

- Option C – Utility Meter Billing Analysis
 - An approach which studies the overall energy use through utility billing data analysis
 - Includes all data derived from Option A & B
- Option D – Computer Simulation
 - A computer simulation modeling at the retrofit or the building level
 - Includes Options A, B & C Data)

Factors That Affect M & V Cost

- Duration of M & V (Before & After)
- Level of detail and effort associated with verifying baseline and post-installation savings
- Sample sizes (number of data points) used for metering representative equipment
- Duration and accuracy of metering activities

Factors That Affect M & V Cost

- Confidence and precision levels specified for energy savings analysis
- Number and complexity of dependent and independent variables that are metered or accounted for in analyses
- Availability of existing data collecting systems

M & V Plan for UESC

- Clarify the objectives
- Determine the baseline approach
- Identify methods and procedures of data gathering and analysis
- Indicate the reporting format and schedule
- Identify budget impacts and resource requirements

M & V In Practice

UESCs do not require guaranteed savings, however:

- Develop a Plan
- Identify a means of measuring and/or calculating the energy savings
- Find a balance between confidence in obtained savings and associated cost

Lessons Learned

- Educate customer on M & V for UESC
- Have same baseline as verification
- Understand and explain variations
- Data charts are worth a 1,000 words
- Government can do M & V
- M & V Data keeps us from replicating bad projects

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